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EPHEDRA SUMLINGENSIS (EPHEDRACEAE) – A NEW SPECIES FROM HIMACHAL PRADESH, INDIA

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Stapf (1889) in the monograph on *Ephedra* L., described 31 species found world over. These species were primarily recognised on the basis of nature of bracts of female strobili, focusing the division into three main sections and their subsequent tribes. Price (1996) brought the species number to 50 by listing the various explored species by the eminent scientists and took geographical distribution as a key factor in classification of species. Sahni (1990) made an attempt to compile the description of eight *Ephedra* species (*E. foliata* Boiss, *E. saxatilis* Royle ex Florin, *E. intermedia* Schrenk & Meyer, *E. gerardiana* Wall. ex Stapf, *E. pachyclada* Boiss, *E. nebrodensis* Tineo, *E. regeliana* Florin and *E. przewalskii* Stapf) reported from hot desert of Punjab, Rajasthan, Gujarat and Cold deserts of Uttarakhand, Himachal Pradesh and Jammu & Kashmir. Florin (1933) segregated *E. gerardiana* var. *wallichii*, a distinct entity as *E. saxatilis*. To look into the current status of Indian Ephedras, the authors concentrated last seven years in exploring Western Himalayas, surveying and documenting each population from Spiti to Lahul in Himachal Pradesh. These field studies encompassed an attention-grabbing population in Sumling, district Spiti, Himachal Pradesh, rarely mixed with *E. gerardiana*. A detailed examination, evaluation and comparison of morphological characters of vegetative as well as reproductive parts of this population with live and the herbarium specimens of the other species housed at Forest Research Institute Dehra Dun (DD), Botanical Survey of India, Dehra Dun (BSD), literature on *Ephedra* taxonomy (Meyer, 1846, Stapf 1889, Pearson 1929, Florin 1933, Atal & Sood 1964, Sahni 1990, Mikage & Kondo 1998) has led us to the conclusion that the *Ephedra* populations of Sumling should be segregated as a new taxon, which is described here as *Ephedra sumlingensis* sp. nov. This new species is closely related to *E. intermedia*. In the absence of type specimen of *E. intermedia*, the new species has been compared to its original description and in the field .

Ephedra sumlingensis P. Sharma & P. Uniyal **sp. nov. (Fig. 1, Plate 1)**

*E. intermedia*Schrenk & Meyer affinis, sed Masculus strobilus pedunculatus, plus minusve substrictus elliptic, 6-8 × 4-4.5 mm, synangia 8, Femineus strobilus pedunculatus c. 6 × 4.5 mm. Semina 2 elliptic, maroonish frons, 4.5-5.0 × 2.5 mm differt.

Typus : India : Himachal Pradesh, Spiti district, Sumling, 3000 m, 24.8.2007. *Sharma & Uniyal* DU (01786 - 0441) (holotype : DU; isotype : BSD and Herbarium DU, Department of Botany).

Plants dioecious, erect, 0.5 – 0.7 m high. Bark brownish black, branchlets light green, 1-2 mm in diameter with ridges and furrows, internodes 2- 4.5 cm. Leaves scaly usually two, sometimes three confined to the nodes, opposite decussate, turning brown at maturity, awl shaped, acuminate, 2-4.5 mm in length, mostly 3/4 connate, sheath membranous, later fissured. Male strobilus stalked, narrowly elliptic, 6-8 × 4-4.5 mm with five pairs of flowers, bracts binate in five pairs, mucronulate, lower and middle pairs ¼ connate, upper ½ ¾ connate, 1-3 × 1-2 mm, perianth almost equaling the subtending bract, 2-2.5 × 2 mm, synangiophore with synangia 4-5 × 0.5 mm, synangia 6-8, usually 4-inner sessile and 4-outer stipitate. Female strobili stalked, 6 ×

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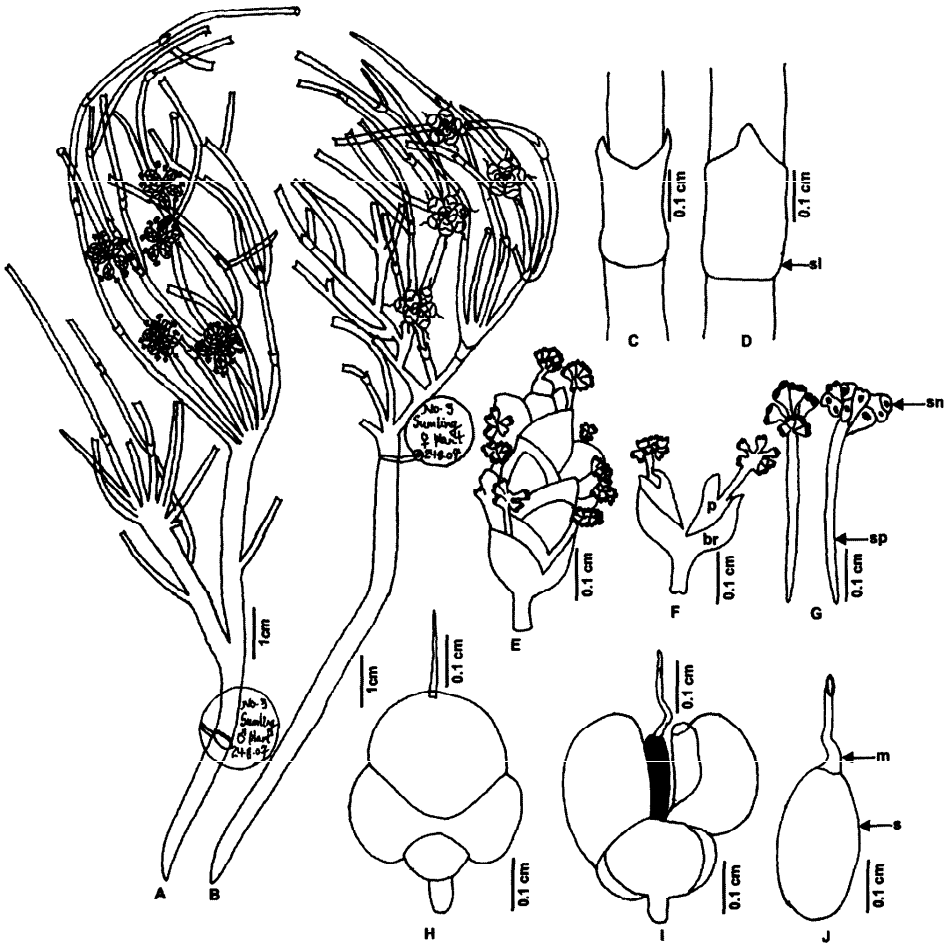


Fig.1. *Ephedra sumlingensis* P. Sharma & P. Uniyal *sp. nov.* :
A & B. Habit male and female plant; **C & D.** Magnified portion of stem showing scaly leaves at the nodal region (front and side view); **E.** Male strobilus showing sessile and stipitate synangia; **F.** Bract enclosing perianth and synangiophore with synangia; **G.** Synangiophore with synangia (front and side view); **H & I.** Mature female strobilus (front and side view highlighting the fleshy bracts enclosing the two maroonish brown colour seeds bearing twisted micropyle & J. Seed with twisted micropyle having oblique opening at the tip region. (Drawn by P. Sharma)

4.5 mm, three pairs of bracts, bracts mucronulate, connate, connation ranges from ¼ in lower and middle, ¾ in upper bract, 3-5.5 × 3-4.5 mm. Seeds two, elliptic, maroonish brown, 4.5-5 × 2.5 mm, two enveloped, micropylar tube twisted, 1-3 mm long, exserted.

Fl. : June - July. *Fr.* : July - September.

Distribution : India : Western Himalayas (Himachal Pradesh).

Habitat : Open ground, dry gravel soil, of Sumling (Spiti district) above 3000 m elevation in the North West Himalaya.

Etymology : The new species is named after the place of occurrence where it was first located, Sumling (Spiti district) in Himachal Pradesh.

Notes : E. sumlingensis is closely related to *E. intermedia* in having strong woody habit, resinous brown pith, red fleshy bracts at the time of maturity of female strobili, twisted micropylar tube and biovulate strobilus bearing mostly two seeds. However, it differs markedly in having brownish black stem bark, light green thin branchlets, bigger scale leaves with acute to acuminate apex, bigger stalked, narrowly elliptic male

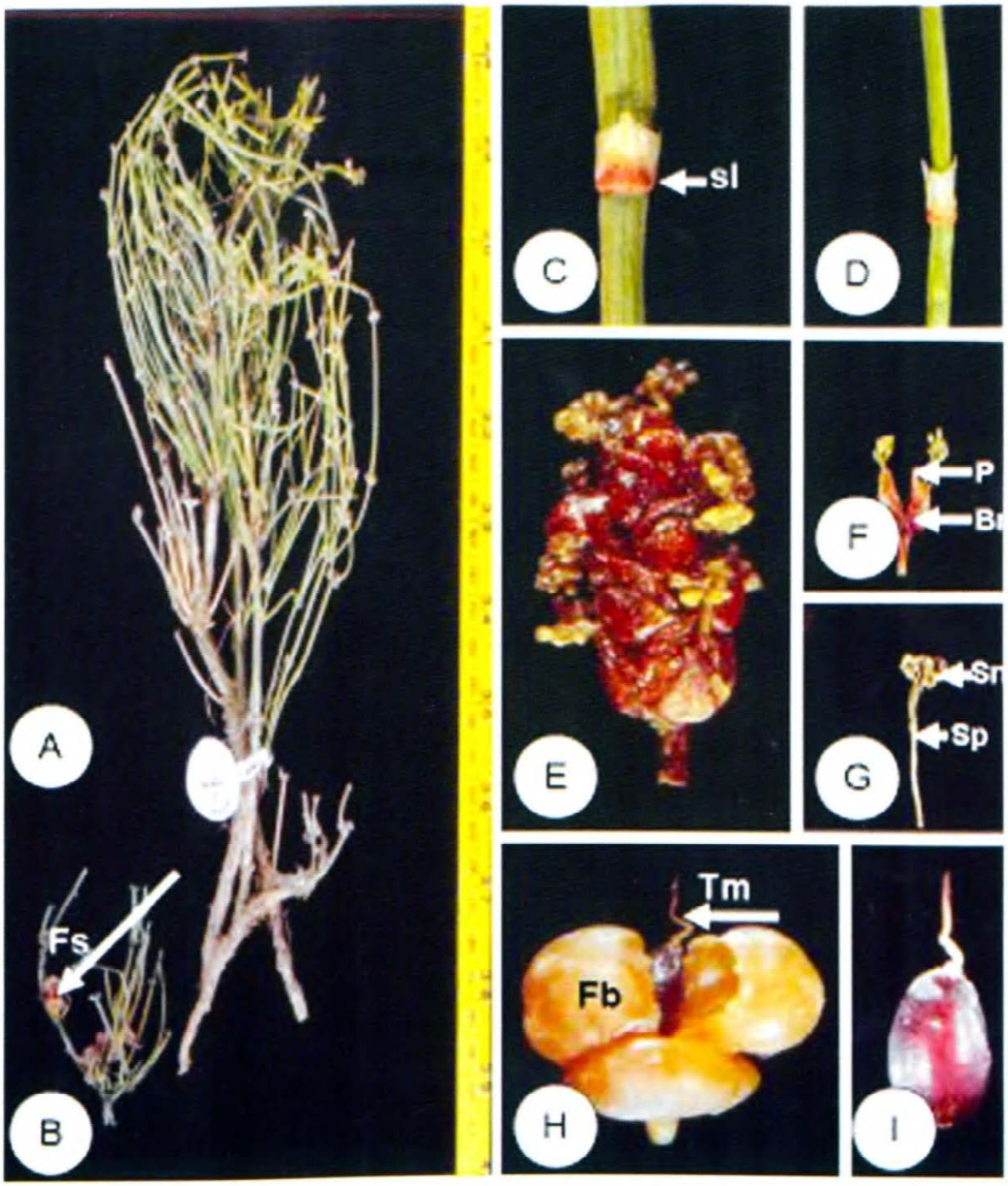


Plate 1 . *E. sumlingensis* P. Sharma & P. Uniyal *sp. nov.* :
A. Habit male plant; **B.** A twig with female strobilus (Fs) at the node (arrow).; **C & D.** Scale leaf (Sl) with front and side view; **E, F & G.** Close-up male strobilus having bract (Br) enclosing perianth (P) and Synangiophore (Sp) with synangium (Sn); **H & I.** Female strobilus (Fs) showing characteristic fleshy bract (Fb) and seed having twisted micropyle (Tm) at the tip region (arrow).

strobili, having five pairs of flowers, bigger stalked female strobili having three pairs of bracts enclosing maroonish brown, elliptic seeds bearing twisted micropyle which used to get straight at the apex as compared to glaucous (greyish green or blue) branchlets, less acuminate triangular scale leaves (2 – 4 mm) categorically sessile, ovoid male strobili (6 -7 × 3.5 - 4 mm) with four to five pairs of flowers, very broadly ovoid, sessile, female strobili (5 × 3.5 4 mm), having four pairs of bracts enclosing brownish black, ovate seeds (4 - 5 × 2 2.5 mm) bearing highly coiled twisted micropyle (3 5 mm long) in *E. intermedia.*

Table 1. Comparison of reproductive character states of *Ephedra sumlingensis* P.Sharma &P.Uniyal *sp. nov.* with the closely allied species *Ephedra intermedia* Schrenk & Meyer.

Character states	Ephedra sumlingensis P.Sharma & P. Uniyal **sp.nov.**	Ephedra intermedia Schrenk & Meyer
Male strobilus		
Shape	Stalked, narrowly elliptic	Sessile, ovoid
Size	6-8 x 4-4.5 mm	6-7 x 3.5-4 mm
Pairs of flowers	Five	Four
Female strobilus		
Shape	Stalked, ovoid	Sessile, very broadly ovoid
Size	6 x 4.5 mm	5 x 3.5-4 mm
Pairs of bracts	Three	Four
Seed		
Shape	Elliptic	Ovate
Colour	Maroonish brown	Brownish black
Micropyle		
Shape	Twisted (one round then straight at apex)	Highly twisted (two to three rounds)
Size	1-3 mm long	3 - 5 mm long

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